

1,104,638



## PATENT SPECIFICATION

DRAWINGS ATTACHED

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## COMPLETE SPECIFICATION

## Improvements in or relating to Closures for Barrels

I, PAUL BENTLEY BUCKLEY, a British Subject, of Briar Knowl, Mirfield, Yorkshire, England, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to closures for barrels, that is to say, bungs or shives (hereinafter referred to as bungs) for barrels, kegs or like containers for liquids, more particularly beer barrels and the like (hereinafter referred to as barrels) which enable connection to be made to the interior of the barrel. Such connections may be for the purpose of pressurizing the contents of the barrel or for dispensing the contents of the barrel, e.g. faucet or delivery tube.

Many forms of bungs have been previously proposed and the form to which the present invention refers is a type made of semi-flexible plastic and comprising a cylindrical part which fits in the bunghole and is retained there by an external shoulder on the cylindrical part which abuts on the interior face of the barrel surrounding the bunghole, the cylindrical part having connected thereto a co-axial re-entrant inner tubular part (usually tapered) adapted to receive and engage connector means for the purpose indicated above and having an end closure adapted to be fractured or knocked away on the connection being made. The inner tubular part may be threaded to receive a threaded connector or may be plain to receive a fining bung or plug. Bungs of the type indicated above may suffer from the disadvantages that when connection is made through the bung and the end closure fractured the end closure or portions thereof may become totally detached and fall into the barrel necessitating eventual removal prior to re-use.

An object of the present invention is to provide a bung of the type indicated in which this disadvantage is obviated.

The present invention consists in a bung

of the type indicated having an end closure in the form of a rupturable end wall formed integrally with the inner tubular part, wherein the end wall is provided with a central weak spot from which the rupture starts, the weak spot being provided by a thinning of the material of the end wall.

The end wall of the bung according to the preceding paragraph may be formed with a weak spot covering only the centre of the wall, or it may comprise a diametric or cruciform linear thinning of the end wall the central portion of which defines the weakspot.

When a connection is made through the bung, connector means in the form of a tubular member engages the end wall, which ruptures from the centre as described above and thereby allows penetration by the tubular member without detachment of the material, the material being retained to form a wiping lip which increases the seal on the inserted tubular member.

The preferred form of the invention is one in which the weak point occupies a central portion of the end wall and this is conveniently achieved by forming the end wall as a plane-concave or double concave surface diaphragm, whereby the material is thinnest at its centre. The concave surface or surfaces may be spherically concave or alternatively may be of conical or other concave form.

Alternatively, the central weak point may comprise a central depression on one or both sides of the end wall and the depression or depressions may be hemispherical, conical, cylindrical or other form.

By selecting suitable dimensions, e.g. the bore of the inner tubular part, with respect to the connector means to be applied thereto the end wall may be subjected to stressing just prior to completion of the connection which builds up radial tensions in the end wall to assist its rupture by the connector tube or even to effect a central starting rupture just prior to contact with the connector tube.

In the accompanying drawings:—

Figure 1 is an axial section through one form of bung according to the present invention,

5 Figure 2 is a detail showing a portion of the bung of figure 1 after the insertion of connector means,

Figures 3 to 11 are details showing portions of alternative forms of bung according to the present invention, and

10 Figure 12 is a plan view of the detail of figure 11.

In carrying the invention into effect according to one convenient mode by way of example, figure 1 shows a bung, composed of plastics material, which has a cylindrical part 1 having an external shoulder 2 and being formed integrally with a tapered re-entrant inner tubular part 3 provided with an internal thread 4.

20 The inner tubular part 3 has an end closure 5 in the form of an end wall which is provided with a central weak spot afforded by a thinning of the material of the end wall.

When a connection is made through the bung by screwing connector means in the form of a tubular member into the tubular part 3, as shown in figure 2, the tubular member 6 ruptures the material of the end closure 5 starting from the central weak spot without detachment of material from the bung. As will be seen from figure 2, the material forming the end closure is retained on the tubular part 3 to form a wiping lip 7 which increases the seal on the inserted tubular member.

35 As shown in figure 1, the thinnings of the material of the end wall 5 to provide the central weak spot is achieved conveniently by making the end wall as a double concave surface diaphragm, the surfaces 8 being spherically concave. Figures 3 and 4 show modifications in which the diaphragm is plano-concave with the concave surface 9 towards and away from the threaded interior of tubular part 3 respectively.

45 Figures 5, 6 and 7 show diaphragms similar to those used in figures 1, 2 and 4, respectively, but with conical concave surfaces 10 instead of spherical ones.

Figure 8 shows a further modification in which the diaphragm carries a central conical depression 11 on one side, and figures 9 and 10 show a diaphragm having central conical and cylindrical depressions 12 and 13, respectively, on both sides of the diaphragm.

55 Figures 11 and 12 show a further modification in which the diaphragm is provided with

two grooves 14 at right angles to provide a cruciform linear thinning of the end wall, the central portion at the intersection of the grooves defining the central weak spot 15.

#### WHAT I CLAIM IS:—

1. A bung of the type indicated having an end closure in the form of a rupturable end wall formed integrally with the inner tubular part, wherein the end wall is provided with a central weak spot from which the rupture starts, the weak spot being provided by a thinning of the material of the end wall.

2. A bung as claimed in claim 1, wherein the end wall is in the form of a double concave surface diaphragm.

3. A bung as claimed in claim 1, wherein the end wall is in the form of a plano-concave diaphragm.

4. A bung as claimed in claim 2 or 3, wherein the or each concave surface of the diaphragm is spherically concave.

5. A bung as claimed in claim 2 or 3, wherein the or each concave surface of the diaphragm is conically concave.

6. A bung as claimed in claim 1, wherein the central weak spot is provided by a central depression on one or both sides of the end wall.

7. A bung as claimed in claim 6, wherein the or each depression is of conical form.

8. A bung as claimed in claim 1, wherein the end wall is provided with a diametric or cruciform linear thinning of the end wall, the central portion of which defines the weak spot.

9. A bung as claimed in any one of claims 1 to 8, wherein the material of the end wall, after rupture, is arranged to form a wiping lip which increases the seal on connector means inserted in the tubular part to cause the rupture.

10. A bung as claimed in any one of claims 1 to 9, wherein the bung is so arranged in relation to connector means to be inserted in the tubular part of the bung that when the connector means is inserted the end wall is subjected to stressing prior to completion of the connection to assist rupture of the end wall or to effect a central starting rupture just prior to its contact by the connector means.

11. A bung of the type indicated substantially as described with reference to the accompanying drawings.

MARKS & CLERK,  
Chartered Patent Agents.  
Agents for the Applicants.

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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of  
the Original on a reduced scale*

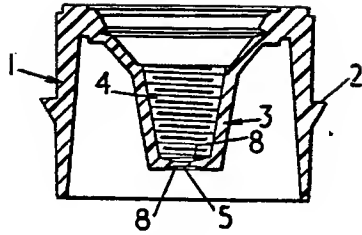


FIG. 1.

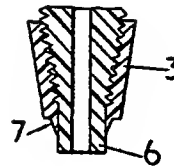


FIG. 2.

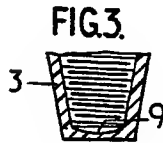


FIG. 3.

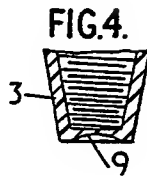


FIG. 4.

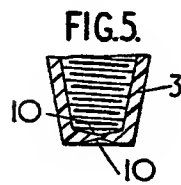


FIG. 5.

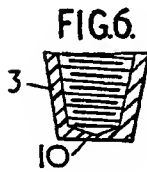


FIG. 6.

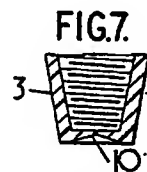


FIG. 7.

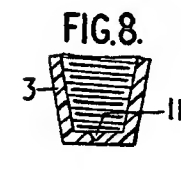


FIG. 8.

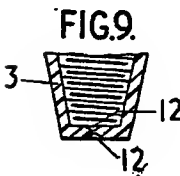


FIG. 9.

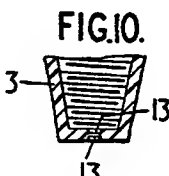


FIG. 10.

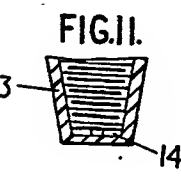


FIG. 11.

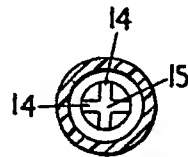


FIG. 12.